



## Miller Investments

I have copied the abstract below and do not see two paragraphs. While it might be argued that there are as many as three sentences with separate thoughts, the first sentence describes the paragraph while the second two sentences are explanatory and further specify the structure being described. The abstract is 62 words which is within the 50 to 150 word requirement

*"An air dielectric printed circuit board fabrication method is disclosed based on the principles of suspended substrate transmission lines as used in microwave assemblies. The transmission line conductor is on a thin dielectric layer suspended in air between two conductive planes. The ground in the area around the transmission line may be cut back either by milling or by photo-etching to preclude shorting the transmission line."*

Please explain what the problem is in further detail.

**Paragraph 4.** You state that the title of the invention is not descriptive.

I disagree strongly with this statement. This invention describes "A METHOD FOR EMBEDDING AN AIR DIELECTRIC TRANSMISSION LINE IN A PRINTED WIRING BOARD(PCB)".

It may be that in legalistic English the word embedded may be objected to for some reason and another word such as "included" might be used instead, but to anyone who speaks the language well, embedded infers that it is a structure somewhat different than the surrounding medium.

An air dielectric transmission line describes the structure being embedded.

A printed wiring board is the older wording used by Boeing Airplane company and many others for what is today often referred to as printed circuit boards. If you prefer the second wording which is abbreviated PCB that would be quite ok.

**Paragraph 5.** You state correctly that the Brief description is in two places. I would like to correct that as shown in the attached revised specification. The reason for this is that the entire section from your paragraph number 0053 through 0143 have been repeated in paragraph 0144 through 0233. Accordingly paragraphs 0144 through 0233 must be removed and will be done so in the corrected application.

You state that there is no figure for via preparation to accompany the via structure. I am attaching a via structure figure for explanatory use. However, the patent is not for the via structure, but for the transmission line suspended in air on the thin dielectric.

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As the trace approaches the via, the air channel around the trace ends with dielectric above and below a short section of the trace adjacent to the via structure. This is necessary to mechanically support the via.

You ask that the patent application follow the section heading sequences a thru l. I have rearranged the paragraphs according to that format.

I have removed paragraphs 0002 through 0050 which are comparison with existing patents and applications which are related. I have removed and re-arranged several other paragraphs and summarized some of the removed paragraphs for clarity. Also, I have removed all the application data referring to backplanes, Personal Computers, and loadboards which are application related.

The intent and substance remains the same.

### Claim objection

6. Informalities corrected

### Claim interpretation

7. Claims revised to define the patent as a structure, within a printed circuit board.
8. Claims revised to be stated in one sentence.
9. Claim 17 withdrawn
10. I have contacted a patent attorney.

### Claim Rejections

11. No one has patented or described in a printed publication the content of this application which is described in the title of this application.

Regarding Claim 1 Shiau:

12. Patent 5,319,329 does not describe a printed circuit board which contains the patent described herein. The patent does describe a mechanical assembly of a printed circuit board and external metal plates bolted to the board. This was a common method of making Suspended substrate filters, because of the high Q

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needed.

Two important differences are:

1. The assembly was not a printed circuit board but rather the combination of a micro-strip printed filter, with the ground plane removed, and external removable metal boxes to provide the ground plane.
2. This type structure was never used for the interconnecting trace but was for filter assemblies.

Regarding claim 2-4

### Claim Rejections

13. Regarding obviousness. Again I would like to point out that this patent is for the air dielectric transmission line being embedded or integrated into the printed circuit board, and especially so because it can be made using standard processes used in printed circuit manufacture and therefore cost effective.

Also, I have spoken to many printed circuit fabrication companies over the last few years, and none I contacted even understood what I was talking about but plainly said it was not possible because they vacuum the air out in order to preclude de-lamination when used.

However, working together with a printed circuit fabrication company they have been able to make me such a printed circuit board, and I have tested it and it meets and exceeds all my expectations. Bandwidth is 4 X that of standard epoxy fiberglass boards and delay is about 55 percent that of such boards.

14. Regarding claim 13

Claim 13 only serves to add some typical dimensions to the patent, so the same arguments above that support claim 1 apply to claim 13.

Per our conversation today, I am faxing this letter and the revised application. I ask you to please examine the above factors and also the revised application for a patent.'

Yours truly,

*Ronald B. Miller*

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